

What is claimed is:

1 1. A system for monitoring intracellular binding interactions, comprising:
2 a reaction vessel having disposed therein a cell suspension comprising biological
3 cells having at least a first component of a binding reaction disposed within the cells, and a second
4 component of the binding reaction comprising a non-protein molecule and having a fluorescent
5 label associated therewith; and
6 a detector in sensory communication with contents of the reaction vessel, the
7 detector being configured to detect an amount of polarized fluorescence emitted from the reaction
8 vessel.

1 2. The system of claim 1, wherein the reaction vessel comprises a well in a
2 multiwell plate.

1 3. The system of claim 1, wherein the reaction vessel comprises a microfluidic
2 channel.

1 4. The system of claim 1, wherein the second component of the binding reaction
2 comprises a binding fragment of a full length protein that is capable of binding the first component.

1 5. The system of claim 4, wherein the second component is between about 4
2 and 100 amino acid residues in length.

1 6. The system of claim 4, wherein the second component is between about 4
2 and about 50 residues in length.

1 7. The system of claim 4, wherein the second component comprises a molecular
2 weight that is less than about 10 kD.

1 8. The system of claim 4, wherein the second component comprises a molecular
2 weight that is less than about 5 kD.

1 9. The system of claim 4, wherein the second component comprises a
2 carbohydrate, a lipid, cAMP, cGMP or diacylglycerol.

1 10. The system of claim 1, wherein the first component of the binding reaction
2 comprises an intracellular nucleic acid binding protein and the second component comprises a
3 nucleic acid probe.

1 11. The system of claim 10, wherein the nucleic acid probe is from about 5 to
2 about 100 bases in length.

1 12. The system of claim 10, wherein the nucleic acid probe is from about 10 to
2 about 50 bases in length.

1 13. The system of claim 10, wherein the first component comprises a DNA
2 binding protein and the second component comprises a fluorescently labeled DNA probe.

1 14. The system of claim 10, wherein the nucleic acid probe comprises a
2 translocation functionality.

1 15. The system of claim 14, wherein the translocation functionality comprises a
2 translocating peptide.

1 16. The system of claim 15, wherein the translocating peptide comprises Antp-
2 HD or a fragment thereof.

1 17. The system of claim 15, wherein the translocating peptide comprises a
2 polypeptide that includes a sequence homologous to residues 48-60 of an HIV-1 tat protein (SEQ
3 ID NO:1).

1 18. The system of claim 10, wherein the nucleic acid binding protein is a
2 component of a cell signaling pathway, activation of the pathway activating or deactivating the
3 nucleic acid binding protein.

1 19. The system of claim 1, wherein the cell is selected from a mammalian cell,
2 bacterial cell, fungal cell, yeast cell, insect cell, and a plant cell.

1 20. The system of claim 19, wherein the cell is a mammalian cell that is selected
2 from a CHO cell, a HEK-293 cell, a L-cell, a 3T3 cell, a COS cell, a THP-1 cell, a RBL-1 cell, a
3 YB-1 cell, a Jurkat cell and a U937 cell.

1 21. The system of claim 1, wherein the cell is disposed in a suspension of cells.

1 22. The system of claim 1, wherein the reaction vessel comprises a window
2 providing optical access.

1 23. The system of claim 22, wherein the reaction vessel comprises a test tube.

1 24. The system of claim 22, wherein the reaction vessel comprises a cuvette.

1 25. The system of claim 22, wherein the reaction vessel comprises a well in a
2 multiwell plate.

1 26. The system of claim 22, wherein the reaction vessel comprises at least a first
2 fluidic channel.

1 27. The system of claim 26, wherein the first fluidic channel comprises at least a
2 first microscale fluidic channel disposed within a body structure.

1 28. The system of claim 27, wherein the microscale fluidic channel comprises a
2 first of at least two intersecting microscale channels disposed in the body structure.